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SCIENCE NEWS LETTER

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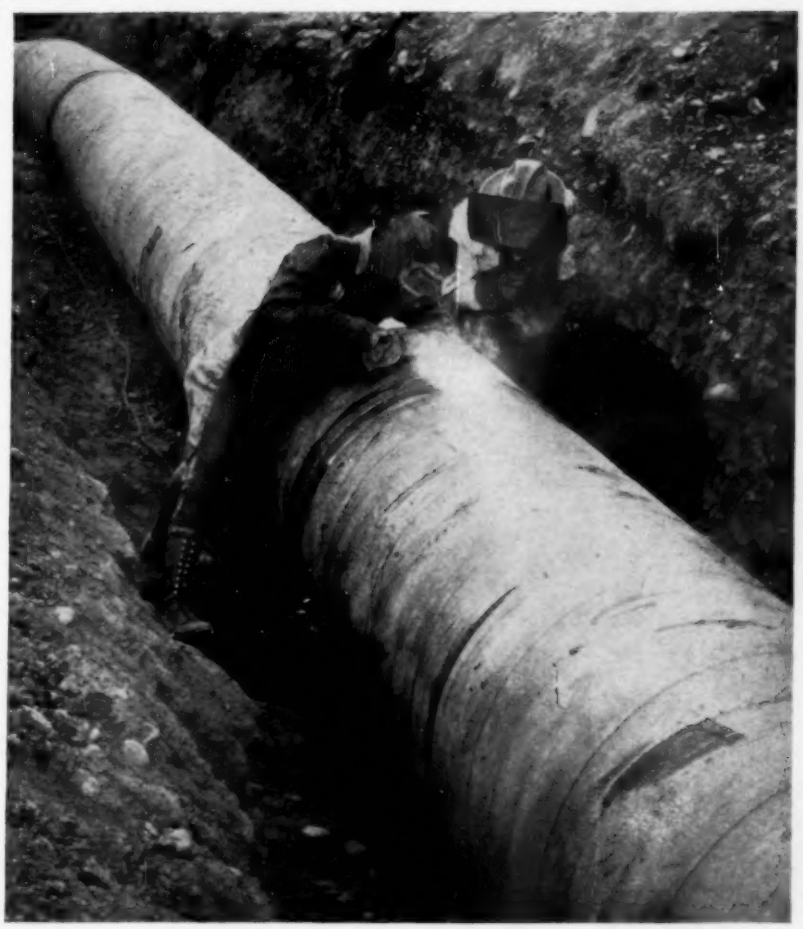
THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MARCH 14, 1931

Electricity Assembles a Steel Serpent

See Page 168

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The Weekly Summary of Current Science

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• DO YOU KNOW THAT •

Southern raccoons furnish pelts for coats, but heavy-furred northern raccoons furnish the collars and cuffs.

Traveling traders began to specialize in their wares along toward the end of the Bronze Age, judging by hoards of old sickles and swords found in Europe.

The skin of a person who gets little sunlight in winter months becomes sensitive to changes in temperature, Cornell professors have found, and this condition may make them more susceptible to colds.

Buenos Aires has a new subway four miles long.

The hog-nosed snake is one of the useful reptiles of New England, feeding largely on field mice and other small rodents.

Antlers of the extinct giant Irish deer sometimes branched to a spread of twelve feet.

Thirty-five years ago, early automobile models were set about 20 inches from the ground; whereas today the usual clearance is about 12 inches.

Mulberry trees are being planted in Mexico, in the hope that a silk industry can be established there.

Speedometer tests of a quail's flight indicate that 58 miles an hour is a top speed for these birds, and 40 miles is the average "cruising" speed.

The "trunk" of the banana plant is a cluster of closely packed leaf stalks.

A mutilated statue on the Acropolis at Athens has been identified as a missing figure from the famous Western Pediment group of the Parthenon.

In a test of the keeping qualities of flowers, those that lasted longest were roses, orchids, lilies, carnations, chrysanthemums, spring flowers and calendulas.

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Science Service presents over the radio, an address

THE RATIONALE OF WEIGHT REDUCTION

By Dr. Francis G. Benedict, director of the Nutrition Laboratory of the Carnegie Institution of Washington, located in Boston. Together with an interesting presentation of the effect of certain foods on the human body, Dr. Benedict will describe the only way to lose weight safely

Friday, March 20, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

GEOLOGY

Age of Earth Determined As Over 2,000,000,000 Years

Radioactive Minerals Form Basis of Four-Year Study by Scientists Appointed by National Research Council

THE AGE of the earth is at least two thousand million years. This is the verdict of a committee of scientists appointed by the National Research Council who have investigated for the past four years this basic problem of science.

The radioactive minerals uranium and thorium, which spontaneously disintegrate into lead, give the best clue to the earth's age. By carefully analyzing the radioactive minerals and their products in a sample of rock, it is possible to tell how long it has been in existence.

The oldest rock in the world whose age has been determined in this way is a piece of uraninite or uranium bearing rock from Sinyaya Pala, Carelia, Russia. It is 1,852 million years old. As it occurs in rocks that were intruded into the surrounding rocks, which therefore must be older, the scientists conclude that the age of the earth must be in round numbers at least two thousand million years.

Estimates Multiplied

Estimates of the age of the earth have been multiplied by more than twenty during the last three decades. The idea that the amount of salt in the ocean is an index of the earth's age was found by the National Research Council committee to be unreliable. Only a hundred million years can be accounted for by this method. This was a favorite figure for the earth's age at the turn of the century.

Prof. Alois F. Kovarik, Yale physicist, and Prof. Arthur Holmes, geologist of Durham University, England, explain in the National Research Council report soon to be issued the methods of age determination based on radioactive disintegration. They are based on the fact that the radioactive elements uranium and thorium disintegrate spontaneously at constant determinable rates and yield lead whose atomic weight varies according to the proportion contributed by its radioactive parents.

The chairman of the committee was Prof. Adolph Knopf of Yale. Prof. Charles Schuchert of Yale compared the radioactive age results with the evidence from the thickness of layers of the earth. Prof. E. W. Brown, Yale astronomer, concluded that while there are no known astronomical methods the two thousand million year age is consistent with astronomical probabilities. Prof. A. C. Lane of Tufts College was also a member of the committee.

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ASTRONOMY

Moon Lacks Oxygen, Its Light Proves

THE NEARLY complete absence of oxygen from the surface atmosphere of the moon has been directly proved by examination of the ultraviolet rays present in full moonlight.

Dr. Brian O'Brien of the University of Rochester announced this conclusion to the American Physical Society as a result of his measurements of the spectrum or rainbow of moonlight.

The test depends on ozone, a form taken by some of the oxygen in the sun's light. Ozone is opaque to ultraviolet light of certain kinds. As no differences can be observed in the strength of these colors in the light reflected from the surface of the moon as compared with light direct from the sun, the absence of oxygen on the moon is shown.

The conclusion is not interfered with by the presence of ozone in considerable quantities in the earth's atmosphere as the amount remains practically constant during the night.

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ZOOLOGY

Rare Giant Pandas Are Added to Museum

THE RARE giant panda—large Asiatic animal with a face like a raccoon, a body like a bear, and feet like a cat—is on exhibition in a new habitat group recently installed at the Field Museum of Natural History. Col. Theodore Roosevelt, now Governor of Porto Rico, and his brother, Kermit Roosevelt, obtained the two specimens.

The giant panda is one of the rarest, and possibly the rarest, of all the world's larger mammals. One of the specimens in the museum group was trailed and shot by the Roosevelt brothers along the Tibetan border, and it is the only one on record ever seen alive and shot by a white man. The other was obtained by the Roosevelts from native hunters.

Pandas are not bears, though they look bearlike. They are a distinct genus, related to both bears and raccoons.

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POSSIBLY THE RAREST OF THE WORLD'S LARGER MAMMALS

GENERAL SCIENCE

U. S. Polar Year Funds Fail Passage by Congress

Action on Bills of Scientific Interest Also Taxes Colored Margarins and Provides Huge Sum for Pine Blister War

AUTHORIZATION for sufficient funds to allow this country to participate in the Second Polar Year in 1932-1933 and in the International Geological Congress in 1932, failed to pass the House in the closing hours of the session because of objections to consideration on the part of certain House members.

An enormous program for soil erosion work and technical study of conservation of rainfall for the Bureau of Agricultural Engineering passed the Senate, but failed of passage in the House.

The oleomargarin law was amended so as to put all yellow colored margarins under the ten cent per pound tax previously applied only to those margarins artificially colored. The new regulations are to be applied because of the recent development of natural colored palm oil margarin. Dairy farmers contended they could not compete with yellow margarin, with a butter flavor, which was subject only to the quarter of a cent per pound tax. Objections to the new regulations were voiced by soy bean growers of the country who say they are being hit along with palm oil importers. Soy bean growers took the position that agriculture was not helped by legislation favoring one agricultural group over another. The strongest arguments for the dairy farmers were advanced by nutrition experts, who told Congress of the advantages to health of the vitamins in milk and butter. Because vitamin A has been so often associated with yellow color in carrots and butter and other foods, it was necessary to get the opinion of an expert regarding the yellow color of the palm oil. Dr. E. V. McCollum, professor of nutrition at Johns Hopkins University, told congressional committees that the "yellow color, or at least almost all of the yellow color in palm oil is cycopin, rather than carotin, mother substance of vitamin A."

The maternity and infancy aid act passed both Senate and House, but with such differences that the conference report, though accepted by the House, did not come to a vote in the Senate. The House added to the Senate bill's authorization of such work by the U. S. Children's Bureau, an amendment providing for the setting up of county rural health units to be administered by the U. S. Public Health Service.

The Bureau of Plant Industry and the U. S. Forest Service were provided by this Congress with an enormous fund for fighting white pine blister rust in western forests. The total amount in various bills ran well over $700,000. In the U. S. national forests alone there are five billion feet of merchantable white pine timber worth $25,000,000, in addition to one million acres of young white pine worth about $180 per acre. On privately owned lands there is also an immense acreage which would be a terrific loss if infected with the rapidly spreading blister rust. Currant and gooseberry bushes spread the disease. The Bureau of Plant Industry will cooperate with states and individual timber owners in the work of eradication this year.

The Bureau of Mines was authorized to establish a mining experiment station at College Park, Maryland.

A bill authorizing the collection of crime statistics passed both houses and was signed by the President.

Isle Royale in Lake Superior was made a national park, but the Everglades National Park bill failed to get through the House, though it passed the Senate.

A memorial in Washington to the late Stephen T. Mather, former head of the U. S. National Park Service, was authorized. The Stephen T. Mather Appreciation Committee has long had in mind several methods of preserving to the nation's memory the work of the father of the national park system. The memorial in Washington is only one of these. Another plan is to erect in each of the 23 national parks and 33 national monuments a bronze plaque decorated with a bas relief bust of Mather, an epitome to his work.

Science News Letter, March 14, 1931

GENERAL SCIENCE

Legislator For Science Lost As Senator Ransdell Retires

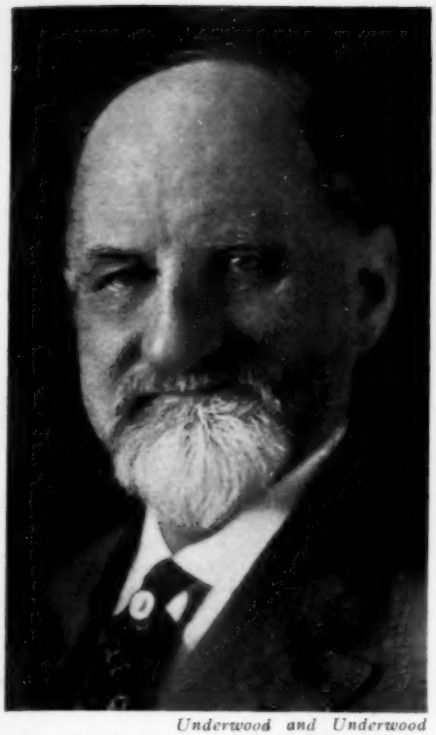
RETIREMENT from the Senate with the end of the last session of Senator Joseph B. Ransdell, Democrat, of Louisiana, marks a loss to science not easily compensated.

Senator Ransdell has been active in sponsoring many public health measures, most notable of which have been the establishment of the National Leprosarium at Carville, La., and the National Institute of Health now operating under the direction of the U. S. Public Health Service. In this institute, scholarships may be given to research workers in order that they may pursue research work in cancer, the common cold, and other diseases the control of which is of vast importance to mankind.

Senator Ransdell also introduced and pushed legislation which was recently enacted establishing a national hydraulic laboratory at the U. S. Bureau of Standards; and it was an amendment which he offered to a pending agricultural appropriation bill that first gave the U. S. Bureau of Plant Industry the means to work for the eradication of the pink bollworm. Flood control legislation has long been another subject upon which he has labored.

In his farewell speech to the Senate last week, Senator Ransdell chose for his theme: The Conservation of Public Health—The Most Important Problem Confronting Mankind.

Senator Ransdell's work was lauded at the close of his speech, by Senators Hatfield of West Virginia and Copeland of New York, both physicians. Senator Copeland said that the United States lagged behind eight or nine other countries in the control of disease. The New York Senator also declared that everyone should read particularly that



Underwood and Underwood
FORMER SENATOR RANSDELL

portion of Senator Ransdell's speech which points out that any increased span of life now enjoyed in this country is due to the elimination of many childhood diseases, whereas men of mature years face prospects of death from disease exactly as menacing as those with which we were confronted fifty years ago.

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PSYCHOLOGY

Feeling Important Helps Heal Crippled Children

THE IMPORTANCE of feeling important is being emphasized by the Social Service Department of the University of Michigan Hospital at Ann Arbor in its special department for physically handicapped children which last year enrolled 1,484 students.

A feeling of inferiority and uselessness among children who are physically handicapped is believed by the hospital authorities to cause a slowing up of physical recovery and possibly later to make the child's life a burden both to himself and to society.

By discovering and developing the special abilities of child patients, the department of special education attempts to make the children forget their weakness and develop a new interest in life.

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MEDICINE

Cross-eyes Are Corrected by New Device Like Stereoscope

Method Devised by English Physician Teaches Eyes to Work Together and Can Be Made Into a Game for Children

A NEW method of correcting cross-eyes or squint, scientifically termed strabismus, has been devised by Dr. Ernest E. Maddox of Bournemouth, who just reported it to the Royal Society of Medicine, London. The new method does not claim to replace the old ways of correcting strabismus by glasses, prisms, or operation, but supplements them.

Dr. Maddox suspected that many of the more incurable cases of cross-eyes are due to persistence of the infantile inability to co-ordinate the movements of the two eyes. He has developed an apparatus designed to discourage the tendency of each eye to do business on its own account instead of in partnership.

The principle which he employs is the use of the hand of the squinter to educate his squinting eye, imitating the natural process of infancy in which the hand and eye mutually perfect their training by trial and error.

This new instrument, the cheiroscope, takes its name from two Greek words meaning "hand" and "look." It is similar to the familiar stereoscope but whereas the stereoscope is held in the hand and the eyes look straight forward at a picture placed in a carrier opposite the lenses, the cheiroscope is tipped so that the lenses are above a horizontal tray surface which replaces the picture carrier and on which the child can play or draw. The child looks down on the tray and a vertical plane divides the field of vision.

If a bead is placed on the tray beneath one eye, a ring on the other half of the tray seen by the other eye will appear surrounding the bead or may be so placed by the child. On the theory that left hand and left eye work together, as do right hand and right eye, the hand on the side of the poor eye is kept busy.

The eye belonging to the hand is tempted to the spot with which the hand is occupied and does its best to help it, even though it only wakes up to do so gradually, while at the same time the surgeon learns what the child's brain is doing by watching the hand.

It is all a game to the child. A fierce open-mouthed lion on one side can be fed by red beads on the other. The picture of a pretty little girl on one side can have a bead necklace constructed round its neck by the child, one eye all the time seeing the little girl, the other the beads.

There are modifications of this apparatus used for different degrees and types of squint. Dr. Maddox points out that there is no reason why the "hand and eye" principle should not be turned to account with an ordinary stereoscope. Here a finger on the side of the amblyopic eye must point out details of the picture, and the trick of this procedure is to prevent the finger from traveling across the mid-line to the picture in front of the good eye.

Dr. Maddox promised that with perseverance and concentration squint training will bring results.

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ASTRONOMY

Friday, March 13, Marked Triple Anniversary

FRIDAY, March 13, far from being unlucky, marked a triple anniversary for astronomers.

Exactly 150 years ago on that day, this year, the first extension to the limits of the solar system was made when William Herschel, then a musician of purely local repute at Bath, England, discovered the planet Uranus through his little six-inch reflecting telescope. That was on March 13, 1781.

On the same date in 1855 there was born in Boston Percival Lowell, who was to found the great modern observatory bearing his name.

And on March 13 last year Prof. Lowell's successors announced the discovery of the planet Pluto, the third modern discovery of a major planet. The second time was in 1846, but on September 23, when Galle, in Germany, discovered Neptune.

Science News Letter, March 14, 1931

ARCHAEOLOGY

A Princess' Guide to Heaven

Instructions For the Life After Death and Her Career For The Past 3000 Years Are Outlined in the Book of the Dead

BY EMILY C. DAVIS

WHERE are the pharaohs of yesteryear?

Not the brown shriveled mummies! We know that those are still lying in the dark in undiscovered tombs in the sand; or else are safely filed away in museums.

But where are the Egyptian royalties themselves? What are they doing in the Elysian Fields for which they prepared so thoughtfully?

The tomb of an Egyptian princess, recently found by the Egyptian Expedition of the Metropolitan Museum of Art, contained her mummy, and with it her Book of the Dead. The book shows the program for her future life, and reveals a very complete picture of what she has been doing the past 3,000 years—if the Egyptian notions of that future life were correctly charted.

The Book of the Dead which was written and illustrated especially for this princess 3,000 years ago is pronounced by H. E. Winlock, director of the expedition, to be a very important accession to the Metropolitan Museum's Egyptian collection. The Museum had previously some sadly damaged writings of this sort and some abbreviated ones. But the new discovery is described as a Book of the Dead "reasonably full, in perfect condition and of very good and characteristic execution. The brilliancy of the colors in the illustrations is astounding. The drawing is skilled and rapid, graceful and absolutely typical of the period of the High Priestly regime in Thebes."

The man who wrote the Book of the Dead for the princess was none too accurate a scribe and would have rated only B in a modern mental alertness test; but before you hear about him and his work, you will want an introduction to the royal lady herself.

If your mental picture of Egyptian princesses presents them before you always slim, young and distinguished in their beauty, this princess may be a shock. She was not only an aged, but an extraordinarily short, fat lady. Her father was a pharaoh not particularly well known today, the King Paynudjem, who ruled in the eleventh century before Christ. She was the Princess Entiu-ny.

Short and fat Entiu-ny was, but she never gave in to her handicap to beauty. To the end of her days on earth she was a most devoted patron of beauty culture. When the expedition staff unwrapped the mummy, they did not recognize the age of the new found royalty.

"At first glance she appeared to be weirdly and grotesquely young," wrote Mr. Winlock in his report to the Museum. "But a very little further examination showed that she owed this look to the dyes her hairdressers had put on her scanty gray locks in life, and to the gruesome art of the undertakers who had filled out and painted her shrunken face after death."

So important to the princess were her trappings of beauty that an extra wig was put into the coffin. This tall pointed wig, soaked with a sticky pomade, is remarkably preserved.

These beauty aids, which created an illusion of perpetual youth, even for thousands of years, would have been more successful in life, we may believe. And if Egyptian dressmakers were clever, the little old Princess Entiu-ny may have been a figure of dignity, even if she did stand only four feet ten without her sandals.

By the time that Entiu-ny passed on to the Underworld, about 1,000 B. C., the Egyptians of Thebes had changed some of their earlier ideas of funerals and preparations for the next world. In Tutankhamen's time, back in the eighteenth century B. C., a royal Egyptian took all manner of furnishings into his tomb with him. The little images of servants might by magic be called into spirit activity to serve the king again in the spirit world, it was believed. The pleasant scenes painted on the tomb walls were expected to be translated into spirit realities.

The king would need all these things, everybody agreed. But whether he needed them or not, the racketeers of Egypt coveted the rich trappings in royal tombs, and risked discovery to remove all the valuables they could find.

So, the Egyptians began philosophically to wonder whether it was worth while to try to take so much material wealth into the next world—especially when robbers made it so hard to keep it anyway. More and more, the people turned their thoughts to spiritual preparations for the future, and began to believe that perhaps after all a good character and a secure knowledge of how to conduct oneself in the presence of the gods would be the best insurance policy for the future.

The Princess Entiu-ny went out to meet the judgment of the god Osiris with that most important guide book for her conduct—her Book of the Dead—about her person.

The long rolled manuscript was in a wooden case shaped like a statue of the god Osiris, who ruled the world of the

COULD YOU PASS?

Here are some of the chief of the 42 sins which the Princess Entiu-ny was prepared to deny when she appeared for judgment guided by her Book of the Dead:

"I have not done evil.
I have committed no violence.
I have not stolen.
I have not caused any man to be killed treacherously.
I have not diminished the offerings of the gods.
I have not lied.
I have made no one to weep.
I have not been impure.
I have not damaged cultivated land.
I have not spoken calumniously.
I have not shown anger.
I have not committed adultery.
I have not refused to hear the words of truth.
I have not polluted water.
I have not caused a slave to be ill-treated by his master.
I have not sworn falsely.
I have not tampered with the plumb-line of the balance.
I have not taken the milk from the mouths of sucklings.
I have not netted the birds of the gods.
I have not turned back the water in its season.
I have not cut a water-channel in its course.
I have not quenched fire in its hour.
I have not despised God in my heart.
I am pure, I am pure, I am pure."

dead. This statue stands over 25 inches tall. A patch of wood fastened with plaster held the papyrus inside the statue. The museum explorers slipped the papyrus out and found it "almost as fresh and solid as the day on which it had been put there nearly three thousand years ago."

Not until the papyrus could be safely transported to New York has it been fully unrolled. To open it without damage, it was necessary to moisten the outer layer, bit by bit, and flatten out that much. Each day a few feet of the manuscript were opened until it stretched to its complete length of eighteen feet six inches.

Two men of very different abilities had worked on the making of Entiu-ny's book, a point which greatly interested the archaeologists. The more skillful of the two drew the illustrations and sketched in the titles, Mr. Winlock points out. The chapter texts were then filled in by an apprentice. This scribe was not only less skillful with his handiwork than the artist, but shocking to relate, he was not letter perfect in his knowledge of the sacred writings.

Mr. Winlock, examining this workmanship, finds back of it some very human traits of the old Egyptians. The writings, he explains, were the main feature of the book. But the purchaser of the book would take for granted that the magic spells and the information were all correct. The royal customer would judge the worth of her book by the delightfully made drawings in it, especially as she herself figured so prominently in the pictures.

The Egyptians were somewhat loose thinkers in regard to the amount of writings needed to carry them safely through the trials and problems of a new life, Mr. Winlock explains. It was left to the professional copyists to choose the important selections, and the amount of additional material added depended on what the customer was willing to spend on the book.

Entiu-ny had ten chapters written out with the appropriate illustrations for seven. And besides this she had illustrations for fourteen more chapters but no text.

The papyrus unrolls to show first the judgment of the dead. Entiu-ny is pictured with flowers on her head and a golden sistrum, or musical rattle, in her hand and a tall incense brazier before her. She is young and slim and beautiful in this picture, as throughout the papyrus. Egyptian artists were chivalrous to the women they painted.

THE SUPREME TRIAL

As pictured in the Book of the Dead prepared especially for Princess Entiu-ny. She is facing Osiris on his throne for the final test before being admitted to the Elysian Fields. Her heart is being weighed against the figure of the Goddess of Truth. She holds in her hand symbols of her eyes and mouth, which must likewise be tested.

The spirit of Entiu-ny, flower-decked and restored to youth, must enter the "Hall of the Two Truths" and appear before 42 judges of the dead. She must address each judge by name and must report to each one that she has not been guilty of some specific sin.

The forty-two sins were like a negative version of the Ten Commandments. Some of the forty-two items seem to us today to be much more fundamental in their social and moral importance than others. To one of the judges the princess must report on the solemn charge of whether she had caused any man to be killed treacherously. But another judge was concerned only with what seems to us a comparatively minor fault—whether she lost her temper.

To aid the Princess Entiu-ny through all this court procedure, her Book of the Dead contained a table of the judges and the sin each one judged. In addition to denying the 42 sins, the princess must also make a speech justifying her claim that she had been pure all her life.

Another chapter shows the princess advancing into the Hall of Osiris, where her heart, her eyes, and her mouth must be judged. This was the greatest ordeal of the dead, the climax of the judgment. The heart of the princess is shown in a balance scale. The heart is weighed against a feather, the symbol of truth, and on that weighing depends her future. If found unrighteous by this supreme test, she is condemned to extinction.

But the Book of the Dead takes it for granted that Entiu-ny will come safely through the inquisition, and the writing shows Osiris giving the verdict: "Her heart is righteous."

As a matter of fact, the princess herself in her lifetime would not have been greatly alarmed over the chance of an adverse verdict. The Book of the Dead prepared one for just such emergencies. There were magic spells to prevent the heart from crying out to denounce its owner if her claims to righteousness were not strictly justifiable. This does not mean that the Egyptians' talk of righteousness was an empty sham. But the spells were considered valuable to carry along to the judgment, just in case the gods proved too exacting.

When her initiation to the Underworld was complete, the princess might settle down to various careers and pleasures. The pictures in Entiu-ny's book show what she expected these to be.

Describing four such pictures, Mr. Winlock writes: "She drives a pair of cream-colored cows to the plough, cracking her whip over their backs. She cuts a luxuriant field of wheat, far taller than her own head, with a gold-colored sickle. She paddles a green canoe on the lakes of Elysium. And finally she guards a pile of yellow grain for her master Osiris."

Strange tasks for a proud and royal Egyptian? It seems so today, but these were the lands of a god and the duties were traditional.

The princess also saw herself in the Underworld in the court of the gods. And there the Book of the Dead leaves her, declaring her rank and titles, as "the praised of those who are Lords of Tribes, the Mistress of a House, the Chantress of Amen-Re, King of the Gods, the Princess Entiu-ny."

MEDICINE

New Type of Deafness And Cure Discovered

DISCOVERY of a new type of deafness with its cause and a method of relieving it has just been announced by Dr. E. M. Josephson of New York.

The deafness is due to spasm of the bone and muscle apparatus of the middle ear and of the eardrum or tympanic membrane. The spasm itself is due to impairment of the circulation in the ear and to reflex irritation from remote points, such as abscessed teeth. Hearing for low tones is especially impaired by this condition which is often found associated with progressive deafness.

Dr. Josephson's discovery was the result of a prolonged study of a large series of cases of this condition. Both the deafness for low tones and the muscle spasm may be relieved by galvanization or treatment with electric current.

"The intact tympanic membrane must be set in vibration by the sound waves in order that they may be transmitted to the middle ear and thence to the inner ear," Dr. Josephson explained in his report in the current issue of *Archives of Otolaryngology.*

"The rigidly retracted drum, with its altered vibrating area, elasticity, and natural frequency does not respond in normal measure to the lower frequencies, and consequently these notes are not transmitted to the inner ear. When the spasm of the accommodative mechanism of the middle ear is relieved, the low tones are again transmitted by the mobile drum."

Science News Letter, March 14, 1931

ENGINEERING

New Welded Pipe Line Carries Water to San Diego

See Front Cover

ON THE front cover of this week's SCIENCE NEWS LETTER the cameraman has caught two electric arc welders tying in an important section of a 19-mile long steel serpent, 40 inches in diameter in some places and 36 inches in others, that will carry water from reservoirs on the Cottonwood and Otay rivers of California to San Diego. This is one of the newer applications of the process of welding which is constantly finding greater use in industry.

The pipe for the new water supply to San Diego comes in 30-foot lengths. A number of these short units are lined up on the surface of the ground and welded together; then the whole section is lowered into the ditch and joined to the end of the completed line. Such a tie-in weld is being made in the photograph. This welding is being done with equipment of the Lincoln Electric Company.

Not only does the size of the pipe line vary, but the thickness of the metal from which it is made changes. A portion of the 40-inch pipe is made of three-sixteenth plate, another part is a quarter of an inch thick and a third section five-sixteenths of an inch through. Sections of the 36-inch pipe are made in same weights and an additional section is three-eighths of an inch thick. These varying thicknesses were found economical because of the changing pressure requirements of the line.

The steel pipe replaces a wood-stave line which had a capacity of 10,000,000 gallons daily. Because of its larger diameter and greater pressure the new line will carry 17,000,000 gallons daily, and in the future booster pumps will raise this figure to 25,000,000 gallons.

Science News Letter, March 14, 1931

ENTOMOLOGY

Bees Travel 40,000 Miles To Make Pound of Honey

A 16-OUNCE jar of honey, no matter how good, is hardly worth a 40,000-mile journey. Yet that is the total distance traveled by many bees to provide the nectar necessary for just that amount of honey, according to C. B. Gooderham, Canadian government apiarist.

Mr. Gooderham has figured it out mathematically. A honey bee weighs approximately only 1/5,000 of a pound, and during the honey flow on each trip she carries approximately half her own weight of nectar. It therefore requires approximately 10,000 flights to gather a pound of nectar. Furthermore, Mr. Gooderham states, nectar loses about half its weight through evaporation.

Taking all this into consideration, as well as the fact that each return flight averages about two miles, it is figured that bees have traveled at least 40,000 miles to provide sixteen ounces of honey.

So it is no wonder that the little honey bee unlucky enough to be born in summer lives but a brief six weeks. Bees born after this summer rush have an average life of seven months.

Science News Letter, March 14, 1931

IN SCIENCE

BOTANY

Japanese Chestnut Yields Three Crops a Year

THREE crops a year is the astonishing yield from a local strain of chestnut bushes found in one corner of the island of Kyushu, in Japan.

So reports Dr. R. Kent Beattie of the U. S. Department of Agriculture, who has just returned from a year in Japan, spent in searching the empire from end to end for disease-proof varieties of chestnut. He found many fine varieties, and sent home about 150 bushels of nuts for planting, besides a large quantity of branches of choice orchard trees for grafting.

But on a mountain slope on one island he found the three-crop chestnuts. They grew only as large bushes, not as trees. They produce their three crops in early summer, late summer and late autumn. The last of the three, ripening in November, is seldom a large crop, but is still worth paying attention to.

There is a legend attached to this three-crop tree, Dr. Beattie says. Many years ago, the people say, a Buddhist saint was making a pilgrimage in that part of the island. Weary and very hungry, he stopped at a cottage and asked for food. The old widow who lived there said, "I have nothing but a few chestnuts, but you are welcome to these." The saint ate, and blessed the old woman, saying, "Henceforth your chestnuts will bear three crops every year." And they have never failed.

Science News Letter, March 14, 1931

OCEANOGRAPHY

Drifting Bottle Makes Four-Year Voyage

FOUR years afloat is the record of a bottle tossed overboard by Capt. G. Gellanders of the British steamer "Burmese Prince" on Dec. 8, 1926, and picked up recently among the Bahamas. The paper in the bottle gave the latitude and longitude of its launching, which showed that it had drifted probably about 6,000 miles.

Science News Letter, March 14, 1931

NCE FIELDS

PHOTOGRAPHY

Memorial for Movie Pioneer Who Disappeared Strangely

A PIONEER inventor of motion pictures is being recognized by a memorial fund being raised in London.

He is Louis Aimé Augustin Le Prince, a Frenchman who lived five years in the United States and nineteen years in Leeds, where a memorial tablet now decorates the site of his workshop.

The scientific magazine, *Nature*, evaluates his work by saying that it seems now to be quite satisfactorily settled that "Le Prince was actually the first to make cinematograph pictures and to show them by methods and apparatus strictly comparable with those in common use today." His 1886 American patent application and his 1888 British patent claim covered punched holes in film fitting on the pins of guide rollers. He took and showed pictures at 12 and 20 per second in 1888.

But he entered a train for Paris on Sept. 16, 1890, only to disappear completely and mysteriously with all his papers and baggage.

Science News Letter, March 14, 1931

PSYCHOLOGY

Study of Individuals Urged To Solve Social Problems

THE SOLUTION of social, political, and economic problems lies not in the adjustment of the individual to existing systems, but in substituting the point of view that such systems are merely part of the behavior of individual human beings. This is the thought expressed by Dr. Floyd H. Allport, of the School of Citizenship and Public Affairs, Syracuse University, in a report to the Psychological Corporation of New York.

Dr. Allport describes some of the ways in which the social psychologist is attacking social problems from this viewpoint.

"Attitude studies are being devised to measure prejudices against races and nationalistic feelings," he explains. "There is evidence of a 'race-name' prejudice as contrasted with a direct racial prejudice, in which the common illusion of a group as over above an individual plays an important part. . . . Studies have been made of the behavior of motorists in response to traffic signals.

"With reference to public opinion, voting, and similar questions, certain experiments have suggested that the average or group opinion may not improve after discussion, but the average individual opinion does improve. Political discussions, in other words, may be a way of producing more enlightened individuals, but not necessarily a more enlightened group opinion."

Voting is influenced, Dr. Allport declares, by many psychological factors, one of them being a "condition of pluralistic ignorance regarding the views of others." It is also affected by the belief in such fallacies as thinking of the group as though it were an individual, leading to such fictions as the "group mind" and the "moral standard of the community."

Science News Letter, March 14, 1931

ZOOLOGY

"Scarface" Bluffed To Lose Yellowstone Racket

SCARFACE, grizzly chief of the bears at the Old Faithful feeding grounds, known to thousands of Yellowstone visitors, has been deposed by a younger bear, who now reigns in his stead.

For many years Scarface, a great thousand-pound bear, ruled the Old Faithful area, and other bears gave him right of way. He was named by Ranger Naturalist Phillip Martindale, who relates the story, because of his torn face and the loss of both ears, mementoes of his fights for supremacy.

One night when Scarface appeared three other bears were feeding. One was a large silvertip or grizzly. Before Scarface came within a hundred feet of the feeding platform this new bear swaggered forward. Scarface also started swaggering in characteristic fighting manner, but he circled away and kept his distance until the newcomer chased him completely out.

Then the victor proclaimed his power in true bear fashion. Going to the nearest tree, he reared himself on his hind legs and measured his full length against it. He now was master.

And Scarface no longer eats with the other bears.

Science News Letter, March 14, 1931

PHYSICS

Cambridge Will Study Magnetism in Intense Cold

A NEW laboratory for the study of magnetic forces at low temperatures is to be added to the University of Cambridge as the gift of the Royal Society of London.

The use of the most intense magnetic forces is planned by Dr. Peter Kapitza, of Cavendish Laboratory, who for some years has been a leader in magnetic research. Magnetic phenomena are most simple at very low temperatures when the complications due to the motion of the atoms and molecules are largely avoided.

The strongest electro-magnets in the world have already been built by Dr. Kapitza in the course of his work, by passing enormous currents through specially designed coils. Seventy thousand amperes have been used in some of his experiments for about a fiftieth of a second.

The planned laboratory will bring England back once more into the center of low temperature research, begun in 1893 by Sir James Dewar. His invention of the Dewar vacuum flask has proved of fundamental importance in the investigation of intensely cold bodies. Liquid hydrogen was first made by Dewar in 1898 in the famous Royal Institution and solid hydrogen in 1899.

Since then liquid helium has been made in Holland, Germany and Canada. Developments in this field are expected in the United States in the near future.

Science News Letter, March 14, 1931

PALEONTOLOGY

Ape Fossils Found Far North in Holland

FOSSIL remains of an extinct species of monkey have been found in Holland, Dr. J. J. A. Bernsen recently reported to the Royal Academy of Holland. The bones were in fragmentary condition, but well enough preserved to show that the animal was similar to the macacques now found around Gibraltar, though somewhat larger. The Gibraltar macacques are Europe's only surviving representatives of the ape-monkey tribe.

The discovery of monkey fossils so far north is taken as an indication of a mild climate in that part of Europe in the ages when they lived there; for apes and monkeys cannot endure cold.

Science News Letter, March 14, 1931

BIGGEST STEEL PINEAPPLE

It serves as the watertower of the world's largest commercial packing plant for the handling of Hawaii's national fruit, and is a conspicuous object on the skyline before the eyes of all incoming steamer passengers.

NATURAL HISTORY

Ireland's Snakes Departed Long Before St. Patrick Came

ST. PATRICK gets credit he never would have claimed for himself, in the matter of the snakelessness of Ireland. He found no snakes there when he arrived. There hadn't been any snakes in Ireland for thousands of years—ever since the last Ice Age at least. Possibly there never were any snakes there at all.

Ireland has never yielded any fossil snakes, even. However, that is no special argument that no snakes ever existed there. Snake bones are small and fragile, and like bird bones do not fossilize well. But it is quite possible that Ireland may have been free of snakes since the very beginning. It is a comparatively new country, geologically speaking, and snakes are comparatively recent products of evolution.

But if there ever were any snakes on the island the cold weather that came with the Ice Age wiped them out. Snakes are warmth-loving animals. Temperate-zone snakes are mere outliers of the great tropical swarms. So when the earth settled down to a hundred thousand years or more of stiff winters, the snakes in the higher latitudes had a hard time of it.

As a matter of meticulous fact, Ireland is not entirely without snakes. The little English grass-snake exists there, but is found only as an exceedingly great rarity.

It is quite true, however, that Ireland has no poisonous snakes. The common adder, the only poisonous snake found in western Europe, which is fairly frequent in England, is quite unknown in the land of St. Patrick's adoption.

When Patrick stooped to pluck the trefoil shamrock to demonstrate the doctrine of the Trinity to a doubting pagan king, he settled one controversy but started another.

Nobody knows what the shamrock really is. The name is simply an Anglicized form of the Celtic "seamrog," and "seamrog" means, simply, "three-leaf."

There are three common shamrocks in Ireland, each with its supporters for Patrician honors. Two of them are clovers and one is the oxalis. All three of them grow in America, either as native plants or naturalized from their Old-World home.

The shamrock question gets no help from the old botanical records. At one end, they do not go back far enough. The first "herbalist" in medieval Europe wrote centuries after Patrick said his last Mass in Ireland. So they could get no good record of the plant he plucked. And at the other end, they do not jibe with modern botany. Present-day botanists base their classification primarily on the structure of flowers, whereas the medieval herbalists used leaves as a starting-point. Hence all three-leaved plants were "shamrocks" to the early botanists, however unrelated they may be in the lists of later ones.

So all true sons of St. Patrick, (and who isn't one, on the Seventeenth of March?) will wear the green trefoil on his day, but they should not inquire too nicely into its botany.

Science News Letter, March 14, 1931

METEOROLOGY

Rainfall For Drought Area Forecast in Next Few Weeks

AMPLE rainfall over the larger portion of the area of the country recently affected by drought is forecast by H. H. Clayton, meteorologist, for the latter part of March and the first week in April.

In a forecast made on Feb. 26 through the use of solar constant data gathered by the Smithsonian Institution and other meteorological information, Mr. Clayton said:

"The indications at present are that in the North Atlantic States the month of March will average normal or somewhat above normal in temperature but with a trend toward temperatures below normal during the latter part of the month and during the first week in April. The precipitation promises to be somewhat above normal.

"In the Lake region and over the upper Mississippi valley and Northwestern States the downward trend of temperature will be more marked than in eastern sections and for this reason ample rainfall is expected over the larger portion of the drought area."

Mr. Clayton made this forecast public exclusively through Science Service. Mr. Clayton has been a collaborator of Dr. C. G. Abot, secretary of the Smithsonian Institution, Washington, who has announced his conclusion that weather is dominated by solar changes.

"I do not claim a finished method of forecasting weather by means of which I am able to foretell the weather for any future date for any part of the earth's surface," Mr. Clayton said in explanation, "but as the results of years of painstaking research I do believe that I have developed a method of forecasting depending upon solar changes which enables me to make reasonable estimate of certain coming changes. These estimates I believe will be nearer the truth than those based on any method known to me, and I have a wide acquaintance with the various methods."

Science News Letter, March 14, 1931

CHEMISTRY

The Metals Boron and Aluminium

"Classics of Science"

Laboratory Experiments Which Gave Chemists Their First Glimpses of the Pure Elements

The practical method for isolating aluminium, which gives us the aluminum of commerce, will appear later as a Classic of Invention.

Boron

ON THE DECOMPOSITION AND RECOMPOSITION OF BORIC ACID; By MM. Gay-Lussac and Thenard. In Annales de Chimie, Paris, 30 Novembre 1808. Translated for the Science News Letter by Helen M. Davis.

WE announced in a note to the Institute the 21st of last June, and we published in the Bulletin of the Philomatic Society for the month of July, that in treating fluoric and boracic acids with the metal potassium there are obtained results which can be explained only by admitting that these acids are composed of a combustible body and oxygen. Nevertheless, since we had never recomposed it, we added that we have never claimed this composition as perfectly demonstrated. Since that time, we have continued and varied our researches; and we can state today that the composition of boracic acid is no longer problematical. In fact we decompose and we recompose this acid at will.

To decompose it, take equal parts of metal and of very pure and vitreous boracic acid in a copper tube to which a tube of bent glass is attached. Place the copper tube in a small furnace, with the end of the glass tube in a flask of mercury. When the apparatus is ready, heat the copper tube little by little until it becomes faintly red; hold it in this state for several minutes; then, the operation being ended, allow it to cool and take out the material. Here are the phenomena which are observed in this experiment.

When the temperature is about 150 degrees, all at once the mixture glows strongly, which appears in a striking manner if a glass tube is used. So much heat is produced that the glass tube cracks and sometimes breaks, and the air is almost driven out of the vessel with force. From the beginning to the end of the experiment only atmospheric air is released with a few bubbles of hydrogen gas which do not amount to the 50th part of that given off when the metal combines with water. The metal is used up decomposing part of the boracic acid; and these two substances are converted by their mutual reaction, into an olive gray material which is a mixture of potassium, potassium borate and the radicle of boracic acid. Extract this mixture in a tube by pouring water onto it and heating slowly. and separate the boracic radicle by washing with water cold or hot, that which does not dissolve is the radicle itself, which shows the following properties.

This radicle is a greenish-brown, fixed and insoluble in water; it has no taste, it has no effect upon the color of either litmus or syrup of violets. Mixed with potassium chlorate or potassium nitrate and projected into a red-hot crucible, a vivid combustion results, of which boracic acid is one of these products. When it is treated with nitric acid a great effervescence results, even in the cold, and when the liquid is evaporated, much boracic acid is obtained. But of all the phenomena produced by the boracic radicle in its contact with other substances, the most curious and the most important are those which it presents with oxygen.

On projecting three decigrams of boracic radicle into a silver crucible at a faint red heat, and covering this crucible with a bell-jar of about a liter and a half capacity, full of oxygen and standing over mercury, it usually burns and the mercury rises so rapidly that it suddenly fills half the bell-jar. Nevertheless, in this experiment the combustion of the boracic acid radicle is far from complete. That which prevents it is that the radicle passes almost entirely into the state of a black oxide, which we believe we are the first to recognize, and, the outer parts of this oxide then passing into the state of boracic acid, this remains and so prevents the inner part from coming in contact with the

BARON THENARD JOSEPH GAY-LUSSAC

The French chemists who, among many famous researches, isolated boron

oxygen. So, to burn it completely, it is necessary to wash it, and put it again in contact with oxygen gas, always at a cherry-red heat. But this time it burns with less force and absorbs less oxygen than the first time, because it is already oxidized; and the exterior part always passes into the state of boracic acid which remains, hindering the combustion of the interior: so to convert all to boracic acid, it is necessary to submit it to a great number of successive ignitions and to as many washings.

In all these combustions, there is always fixation of oxygen without liberation of any gas; and all give acid as the product. Upon treating these products with boiling water there is obtained by suitable evaporation and cooling crystallized boracic acid, of which we have presented a sample to the Institute.

Finally, the boracic acid radicle behaves in air just as in oxygen, with the difference only that the combustion is less lively.

It follows then from all these experiments that boracic acid is actually composed of oxygen and a combustible body. We have proved conclusively that this body, which we now propose to call *bore*, is of a definite nature, which can be placed beside carbon, phosphorus, and sulphur; and we are led to think that to pass into the state of boracic acid it requires a great quantity of oxygen, but that before arriving at that state it first passes through that of the oxide.

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Aluminium

On ALUMINIUM, By F. Wöhler. In Annalen der Physik und Chemie, Leipzig, 1827.

TO learn to know the physical and chemical properties of the elements which in the oxidized state make up the greater part of the surface of the earth, is from many points of greater interest than the study of many of the true metals; for upon our knowledge of these bodies depends in part our ability to imagine the formation of the earth's surface from the original material of volcanic eruptions and so forth. Of all the radicles in the earth-substances in the most abundant kinds of soil, we have up to now learned to know only kiesel-earth, through Berzelius' experiments. H. Davy seems to have separated the radicle of alumina, both by the agency of the electric battery upon a fused mixture of alumina and potash, and by the action of potassium vapor upon alumina at white heat. But in both cases it did not occur to him to separate the reduced metal from the remaining mass; so he could not have studied its properties.

Some years ago Oersted discovered an easy method of combining chlorine with the radicle of alumina, by the application of a very ingenious method, which consists of allowing chlorine gas to stream over incandescent alumina mixed with powdered charcoal. From this compound there is obtained then, by means of potassium-amalgam, an amalgam of aluminium, which oxidizes very quickly in air, and by distillation of the mercury the remaining aluminium can be recovered. Of the aluminium so obtained he says only that it was a lump of metal, of the color and luster of tin.

I have repeated this experiment of Oersted's, but got no positive result from it. By distillation of the potassium amalgam, after it was heated with the aluminium chloride, there remained at the end a gray molten mass of metal, which, however, evaporated when the heat was increased into a green vapor and distilled over as pure potassium. After this I looked around for another method, although I do not wish to say that it is not possible to reduce aluminium by this one. Since Oersted noted at the end of his communication that he could not look upon his researches on aluminium as complete, it might seem, although many years have passed since then, as though I have forced my way into a research success-

COLORBLINDNESS

was first described by

Dalton

who had it, and therefore could wear red, though he was a Quaker.

THE NEXT CLASSIC OF SCIENCE

fully begun by another but uncompleted, because they promise new and perhaps more brilliant results. I must remark here that Herr Oersted himself encouraged me to pursue this research further. . . . .

Metallic Aluminium

The method for reducing and exhibiting this metal rests, it seems to me, on the decomposition of aluminium chloride by potassium and on the property of aluminium of not oxidizing in water. If a tiny piece of aluminium chloride be warmed in a glass tube with some potassium the violent reaction, accompanied by fire, shatters the tube. I then tried the reaction in a little platinum crucible, which succeeded very well. The reaction is always so violent that the cover must be fastened on with wire, so that it will not be thrown off, for the reaction, which gives off only a moderate amount of heat in the open, will suddenly of itself raise the crucible to red heat. Platinum will scarcely withstand it. On this account, to guard against possible contamination of the reduced aluminium with any platinum which may be lost, I always afterward made the reduction experiments in a little porcelain crucible, and went about it in the following way: Put into the bottom of the crucible a little piece of potassium free from carbonate, from which the kerosene clinging to it has been carefully removed. Cover this with a little piece of aluminium chloride of about the same volume. Then heat the crucible, covered with its lid, at first gently, until the combustion appears, which keeps going by itself, then strongly when this last is over. The largest piece of potassium with which I have attempted to work at one time up to now is ten balls the size of peas; in a Hessian crucible one could manage to operate with larger amounts. With these quantities the amounts of the reacting substances must be arranged either so that there is so much potassium that the reduced mass is alkaline, or so much excess aluminium chloride that it can be seen to evaporate at the moment of reduction. The reduced mass is as a rule fully molten and blackish gray. The *fully* cooled crucible is dropped into a glass of water, in which the salt mass, under gentle heating releases evil-smelling hydrogen gas and a gray powder separates, which on closer inspection especially in sunlight appears as composed of little scales of pure metal. After it has settled, pour the liquid off, put it on a filter, wash it with *cold* water and dry it. It is the metal aluminium.

Science News Letter, March 14, 1931

PHYSIOLOGY

Fish Blood Found Rich in Phosphorus

STUDIES upon the composition of the blood of different animals which have just been completed at Cornell University show that the blood of the lower forms such as fish and turtles contain nearly three times as much phosphorus as that of higher vertebrates. Fish have long been reputed to be high in phosphorus but the various forms in the blood have not been studied previously. Most of the phosphorus of fish blood is concentrated in the red cells.

This high phosphorus value for fish blood is interesting in the light of the meat diets used for rearing trout in most hatcheries. Brook trout grow to maturity upon food that is very rich in phosphorus, such as beef liver. One might expect bloods rich in phosphorus among the carnivorous fish but not among the omnivorous, such as carp. The bloods of both pike and carp were analyzed, however, and found to be equally high in phosphorus.

Science News Letter, March 14, 1931

ARCHAEOLOGY

Hands of Clay Provided For Egyptian Burial

HANDS and feet modeled in terra cotta are a strange feature of the latest tomb discovery at Giza, Egypt, where Prof. Selim Hassan, archaeologist of the Egyptian University, is excavating near the great Sphynx.

The tomb that has been discovered belonged to a woman of the fourth dynasty, about 2900 B. C. The artificial hands and feet are believed to be a unique discovery in the archaeology of Egyptian tombs. It is speculated that they were placed in the tomb to be of use to the woman in the world of the dead.

To find so old an Egyptian burial not plundered by robbers is unusual, and great interest is manifested in the tomb furnishing of the period. The sarcophagus of white limestone lay in the center of the tomb chamber, facing east. Seventy-eight alabaster vases were counted in the room's furnishings, and pottery vases besides. Skeletons of two animals were near the sarcophagus, and also a table of offerings.

The woman buried here was adorned with gold necklaces, bracelets, and anklets, and on her head was a fillet of gold of unusual workmanship.

Science News Letter, March 14, 1931

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PUBLIC HEALTH

Amended Quarantine Law To Relieve Congestion

AN amendment to the quarantine law of 1893, permitting quarantine officers to inspect ships at any hour during the day or night has just gone into effect, the U. S. Public Health Service has announced.

This amendment was characterized by health officials as one of the most important and progressive steps in quarantine regulations since the passage of the original act. By it harbor congestion will be relieved and accidents reduced, valuable time will be saved to commerce and the U. S. Public Health Service, and shipping interests will save considerable money on cargo insurance, it was pointed out.

The original quarantine act provided that officers could board ships for inspection only between the hours of sunrise and sunset. It was considered dangerous to pass a ship at night because the quarantine officer could not see well to make his inspection. Now with electric lights on ships and wharves, the inspection can be made as well by night as by day.

On each Monday and Tuesday morning from 20 to 25 vessels that have come in during the night will be found anchored in New York harbor awaiting quarantine inspection. This causes dangerous congestion and is said to be one cause of the increasing number of harbor accidents, particularly in fogs. Through the new regulation, these ships can be inspected and allowed to proceed to their berths shortly after arrival, leaving the harbor free for the morning coastwise and other traffic.

A large financial saving is expected to be made, particularly at western ports, where three- and four-million dollar shipments of silk come in from the Orient. The saving of a few hours' time will save large sums on the insurance of these cargoes, it is claimed.

Science News Letter, March 14, 1931

ARCHAEOLOGY

Depressions May Have Caused Six Stages of Mound Building

PREHISTORIC America had its periods of building activity, and perhaps, in between, its periods of depression. Evidence that no less than six different times Indians of the East St. Louis region organized their efforts to work on the great Powell Mound is the latest discovery made by archaeologists who are now excavating the base of the ancient earthen monument.

Examination of the site indicates that there was no very long gap of inactivity between the building of the six successive stages of the mound, Dr. A. R. Kelly, director of Illinois Archaeological Explorations, stated to Science Service. The mound is definitely prehistoric and may well be at least one thousand years old, he said.

The Powell Mound, which is part of the famous Cahokia group of Indian mounds, is proving a strategic site for scientists who are writing America's prehistory. Explorations so far offer convincing assurance that Indians of Cahokia were linked culturally with Florida and the Gulf of Mexico to the south and also to the north with Wisconsin.

Dr. W. C. McKern of the Milwaukee Public Museum finds a marked similarity between the Indians of East St. Louis, as shown by their mound in its contents, and the mound building Indians of Aztalan, in Wisconsin.

A link with the south is found in two species of shells in the Cahokia burials. These shells are from the Gulf of Mexico. Copper-covered wooden objects shaped like spindles and believed to be either ornaments or game pieces have been found in Powell Mound, and these are almost exactly like objects found in a Florida mound twenty-five years ago, it is recalled.

Science News Letter, March 14, 1931

BOTANY

Nature Ramblings

By FRANK THONE

The Bowyer's Tree

"What of the bow? The bow was made
in England,
"Of true wood, of yew wood, the wood
of English bows——"

A FINE song for archers, even though the men who sped the terrible steel-tipped sleet of Agincourt knew it not. But they would have sung it had they known it, for they knew the value of the yew-wood bow.

There is something peculiar about the wood of this evergreen tree, stiff and yet springy, that gives it high value for this particular purpose. A wood of greater elasticity would not have the proper "drive" to impart to the arrow; one of greater stiffness would be too hard to bend and might break when pulled upon.

The yews of England were not sufficient in the old days to supply bow-staves for all the fighting English men who followed their armored lords over the French marches or into the Holy Land. For this reason Spanish yew had to be imported, and an old English law required that with every cask of Spanish wine the Spanish exporters had to ship a certain number of good yew staves. Modern bowyers like the Spanish yew when they can get it, but it is scarce and increasingly hard to obtain. They find, however, that the California yew serves excellently instead.

The yew native to eastern North America is a low and sprawling bush rather than a tree, and never produces big enough branches to be shaved into bows. There is also a Florida yew, an exceedingly rare species, which shares this small-growth habit of the Canadian yew. These two species are of value chiefly as ornamental plants.

Science News Letter, March 14, 1931

ZOOLOGY-GEOGRAPHY

Polar Cold Seen as Agent In Distribution of Animals

ICE, and the cold winds and snow-storms that blow from the face of glacial regions, have been the great shepherds that arranged the world's present distribution of animal life.

This was the belief of the late Prof. W. D. Matthew of the University of California, as expressed in a contribution sent to the international scientific journal, *Scientia*, just before his death.

Looking at a globe, or at a non-distorted map of the world, Prof. Matthew saw that the continents tend to bunch together at the northern "end" of the earth, with their southern tips stuck down prongwise and far apart. During the warm climatic phases which are really the normal state of world weather in the geological time sense, animals can travel about very freely in this great northern land zone, and flourish near the North Pole.

Then, when some hundreds of thousands of years of stiff winters come on, with perhaps an ice age to climax the matter, all but the very hardiest of them must move southward or perish. So long as the barrier of ice or of persistent cold weather stands against them, "East is East, and West is West, and never the twain shall meet." American animals evolve in America, Asiatic in Asia; and there is no intercontinental traffic.

This cycle, of free intercourse followed by blockades of cold, repeated itself several times in the earth's long history, Prof. Matthew held. Each time it happened, it started a new series of southward migration waves, and at the same time the disturbances and hard times forced a speeding-up in the evolutionary process.

Science News Letter, March 14, 1931

A seaside villa belonging to the Emperor Nero has been excavated at Anzio, to the south of Rome.

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• First Glances at New Books

Physics

RADIATIONS FROM RADIOACTIVE SUBSTANCES—Sir Ernest Rutherford, James Chadwick, and C. D. Ellis—*Macmillan,* 588 p., $6.50. A long-awaited reissue of the classic text, "Radioactive Substances and Their Radiations," by one of the most distinguished contributors to this field. As the change in title indicates, the unravelling of the long series of radioactive transformations and elements has been omitted in the new volume. Thus more space is now left for the study of recent work on the alpha, beta and gamma rays and the effects produced in their passage through matter. The book stays close to the experimental results and does not use the new quantum theory.

Science News Letter, March 14, 1931

Botany

SCHOOL BOTANY—Macgregor Skene—*Oxford University Press,* 240 p., $1.50. An excellently conceived textbook of pre-college grade, by one of the leading British botanists. It approaches the subject mainly from the point of view of physiology and gross morphology, and does not involve the use of the microscope.

Science News Letter, March 14, 1931

Psychology

PROBLEM TENDENCIES IN CHILDREN—Willard C. Olsen—*University of Minnesota Press,* 92 p., $2. Theoretically, if a thing exists it can be measured, but there have been many practical difficulties in the way of measuring character traits although we all know that they exist. Here is proposed a method for the description and scaling of "problem tendencies."

Science News Letter, March 14, 1931

Psychology

BEHAVIORISM—John B. Watson—*Norton,* 308 p., $3. This new edition of Dr. Watson's lectures has been revised to bring it up to date, and some new material has been added.

Science News Letter, March 14, 1931

Psychology

THE BEHAVIOR OF THE NEWBORN INFANT—Karl Chapman Pratt, Amalie Kraushaar Nelson, and Kuo Hua Sun—*Ohio State University Press,* 237 p., $3. The report of a very thorough investigation of the response to external stimuli of healthy infants during the first two weeks of life. The authors, working under the supervision of Drs. Albert Paul Weiss and Andrews Rogers, found no evidence of rage, fear, love, or even the defense reactions which have been previously reported by other investigators in this field.

Science News Letter, March 14, 1931

Psychology

THE ENLARGEMENT OF PERSONALITY—J. H. Denison—*Scribner's,* 340 p., $3. The author points out how the Catholic confessional, the Protestant "mourners' bench," the various modern mind cures, and the ancient sacrifices, all may change the personality by creating in the individual a new idea of himself. He believes that this is the key to the problem of becoming what you would like to be.

Science News Letter, March 14, 1931

Biology

A SURVEY OF NATIONAL TRENDS IN BIOLOGY—Edward G. V. K. Menge—*Bruce,* 156 p., $2. The author has done a unique thing: he has made a survey of modern biological work not only with the question, "Who?" in his mind but also with the question "Where?" The results, which were presented first as lectures in two South American scientific centers, throw most interesting, and in places most curious, highlights on biological research as it stands at the present moment. Dr. Menge's findings should enable those responsible for the direction of such research either to stress such lines as their special environments may make most profitable, or fill out existing gaps if they aim at completely rounded programs within a given national group.

Science News Letter, March 14, 1931

Chemistry

FUNDAMENTALS OF ORGANIC CHEMISTRY—Harry F. Lewis—*McGraw-Hill,* 390 p., $2.75. A concise and thoroughly up-to-date introduction to all fields of organic chemistry for college and university use, attractively illustrated with photographs of manufacturing plants.

Science News Letter, March 14, 1931

Physics

ELECTRICITY, A STUDY OF FIRST PRINCIPLES—Elmer E. Burns—*Van Nostrand,* 235 p. A good high school text with no particular axe to grind.

Science News Letter, March 14, 1931

Zoology

COLD-BLOODED VERTEBRATES—Samuel F. Hildebrand, Charles W. Gilmore and Doris M. Cochran—*Smithsonian Institution Series, Inc.,* 375 p. Most of us could profit by a better acquaintance with the three cold-blooded stages that preceded mammals in the development of man's family tree. This new volume in the Smithsonian Institution scientific series gives a most excellent opportunity to do this. Written by authorities, excellently illustrated, most attractively made up, it is a book to be welcomed with pleasure, shown with pride and read with interest.

Science News Letter, March 14, 1931

Archaeology

THE BRONZE AGE—V. Gordon Childe—*Macmillan,* 258 p., $3.50. Here is a very satisfactory introduction for students to the men and women of the Bronze Age. The first half of the book explains the arts and industries, ornaments, weapons, ships, writing, and other features of life in that period. The second part deals historically with the Bronze Age, entirely north of the Alps. Drawings and a map add to the usefulness of the volume.

Science News Letter, March 14, 1931

Psychic Phenomena

THE ENCHANTED BOUNDARY—Walter Franklin Prince—*Boston Society for Psychic Research,* 348 p., $3.25. Attacks upon the validity of psychic phenomena, made by Houdini, Munsterburg, and other individuals, are reattacked in this volume by Dr. Prince, who is executive officer of the Boston Society for Psychic Research. The scope of the work is indicated in the subtitle "A survey of negative reactions to claims of psychic phenomena, 1820-1930."

Science News Letter, March 14, 1931

Medical History

PHYSIOLOGY — John F. Fulton — *Hoeber,* 141 p., $1.50. Fifth of a series of pocket-sized primers on the history of medicine edited by E. B. Krumbhaar, M. D., under the title Clio Medica. The style is clear, concise, and readable. Several interesting illustrations, a bibliography and double index add to the value of the book. Of special interest to physicians, but not too technical for the layman with some scientific background.

Science News Letter, March 14, 1931